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| Application Number | 09/819,573 |
| Filing Date | 03/28/2001 |
| First Named Inventor | KUCHI |
| Group Art Unit | 2631 |
| Examiner Name | CHEBRETINS |
| Attorney Docket Number | NC17533 |

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| Sheet | 1 | of | 5 |
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| FOREIGN PATENT DOCUMENTS | | | | | | | |
|--------------------------|-----------------------|-------------------------|---------------------|---|--|---|----------------|
| Examiner Initials* | Cite No. ¹ | Foreign Patent Document | | Name of Patentee or Applicant of Cited Document | Date of Publication of Cited Document MM-DD-YYYY | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | T ² |
| | | Office ³ | Number ⁴ | | | | |
| JS | | WO | 97/41670 | | AT&T Corp. | 11-06-1997 | |
| JS | | WO | 99/14871 | | AT&T Wireless Services, Inc. | 03-25-1999 | |
| JS | | WO | 01/56218 A1 | | Telefonaktiebolaget LM Ericsson Inc. | 08-02-2001 | |
| JS | | WO | 00/11806 | | Ericsson Inc. | 03-02-2000 | |
| JS | | WO | 00/18056 | | Hughes Electronics Corp. | 03-30-2000 | |
| JS | | WO | 00/49780 | | Motorola Inc. | 08-24-2000 | |
| JS | | WO | 00/51265 | | Motorola Inc. | 08-31-2000 | |
| JS | | WO | 01/19013 A1 | | Home Wireless Networks Inc | 03-15-2001 | |
| JS | | WO | 01/63826 A1 | | Nokia Networks OY | 08/30/2001 | |
| JS | | WO | 01/69814 A1 | | Nokia Networks OY | 09/20/2001 | |

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¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

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First Named Inventor

KUCHT

Group Art Unit

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Examiner Name

~~CHEBRETINSAE, T.~~

Attorney Docket Number

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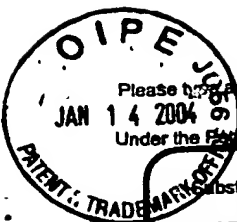
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Sheet **3** of **5**

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| Attorney Docket Number | NC17533 |

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

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|--------------------|-----------------------|---|----------------|
| U | | D. MIHAI IONESCU; New Results on Space-Time Code Design Criteria; 1999 IEEE; pp. 684-687; 0-7803-5668-3/99; | |
| U | | TAROKH, V., et al.; Space-Time Codes for High Data Rate Wireless Communication: Performance Criterion and Code Construction; 1998 IEEE; IEEE TRANSACTIONS ON INFORMATION THEORY, Vol. 44, No. 2, March 1998 | |
| U | | Edited by HOLMA H., et al.; WCDMA for UMTS Radio Access for Third Generation Mobile Communications; Reprinted June 2000; page 97; John Wiley & Sons, Ltd., Baffins Lane, Chichester, West Sussex, PO19 1UD, England. | |
| U | | TAROKH, V., et al.; Space-Time Block Coding for Wireless Communications: Performance Results; 1999 IEEE; IEEE Journal on Selected Areas in Communications, Vol. 17, No. 3, March 1999 | |
| U | | TAROKH, V. et al; New Detection Schemes for Transmit Diversity with No Channel Estimation; 1998 IEEE; pp. 917-920 0-7803-5106-1/98. | |
| U | | NAGUIB, A.F. et al; Space-Time Coded Modulation for High Data Rate Wireless Communications; 1997 IEEE; pp. 102-109; 0-7803-4198-8/97. | |
| U | | SHIU, D. et al.; "Scalable Layered Space-Time Codes for Wireless Communications: Performance Analysis and Design Criteria"; 0-7803-5668-3/99; 159-163 pp.; 1999 IEEE; University of California at Berkeley USA | |
| U | | ALAMOUTI, S.M. et al; Trellis-Coded Modulation and Transmit Diversity: Design Criteria and Performance Evaluation; 1998 IEEE; pp. 703-707; 0-7803-5106-1/98. | |
| U | | SHIU, D. et al.; "Layered Space-Time Codes for Wireless Communications Using Multiple Transmit Antennas"; 0-7803-5284-X/99; 436-440 pp.; 1999 IEEE; University of California at Berkeley USA | |
| U | | HASSIBI, B. et al; "High-Rate Linear Space-Time Codes"; IEEE April 2001; Pg2461-pg2464, 0-7803-7041-04/01. | |
| U | | LO, T. et al; Space-Time Block Coding - From a Physical Perspective; 1999 IEEE; pp. 154-158; 0-7803-5668-3/99. | |

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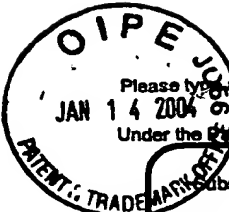
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| Examiner Name | GHEBRETINSAE, T. |
| Attorney Docket Number | NC18833 |

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|--------------------|-----------------------|---|----------------|
| 8 | | SESHADRI, N. et al; Space-Time Codes for Wireless Communication: Code Construction: 1997 IEEE; pp. 637-641; 0-7803-3659-3/97. | |
| 8 | | TAROKH, V., et al.; The Application of Orthogonal Designs to Wireless Communication; 1998 IEEE; pp. 46-47; 0-7803-4408-1/98. | |
| 95 | | TAROKH, V. et al; Space-Time Codes for High Data Rate Wireless Communication: Performance Criteria in the Presence of Channel Estimation Errors, Mobility, and Multiple Paths; 1999 IEEE; IEEE TRANSACTIONS ON COMMUNICATIONS; Vol. 47, No. 2; February 1999 | |
| 8 | | TAROKH, V. et al; A Differential Detection Scheme for Transmit Diversity; 1999 IEEE; pp. 1043-1047; 0-7803-5668-3/99. | |
| 2 | | FOSCHINI, G.; Layered Space-Time Architecture for Wireless Communication in a Fading Environment When Using Multi-Element Antennas; Bell Labs Technical Journal, 1996; Pg41-Pg59. | |
| 8 | | TIRKKONEN, O. et al.; Complex Space-Time Block Codes for Four Tx Antennas; IEEE; 2000; pg1005-pg1009; 0-7803-6451-1/10. | |
| 2 | | HOTTINEN, A. et al.; Closed-loop transmit diversity techniques for multi-element transceivers; IEEE 2000; pg70-73; 0-7803-6507-0/00. | |
| 2 | | TIRKKONEN, O. et al.; Minimal Non-Orthogonality Rate 1 Space-Time Block Code for 3+ Tx Antennas; IEEE Sept. 6-8, 2000; 6th Int. Symp. on Spread-Spectrum Tech. & Appl., NJIT, New Jersey, USA; pg429-pg432. | |
| 2 | | SWEATMAN, C. et al.; A Comparison of Detection Algorithms including BLAST for Wireless Communication using Multiple Antennas; IEEE 2000; pg698-pg703; 0-7803-6465-5/00. | |
| 2 | | DAMEN, O. et al.; Lattice Code Decoder for Space-Time Codes; IEEE 2000; pg161-pg163; 1089-7798/00; IEEE Communications Letters, Vol. 4, No. 5, May 2000. | |
| 2 | | CALDERBANK, A. et al.; Space-Time Codes for Wireless Communication; 19997 IEEE; ISIT 1997, Ulm, Germany, June 29-July 4; pg146. | |

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| Examiner Name | GHERRETINSAE, T |
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|-----------------------|--------------|---|----------------|
| W | | TAROKH, V. et al.; Recent Progress in Space-Time Block and Trellis Coding; 1998 IEEE; ISIT 1998, Cambridge, MA, USA; August 16-August 21; pg314. | |
| Z | | ROHANI, K. et al.; A Comparison of Base Station Transmit Diversity Methods for Third Generation Cellular Standards; 1999 IEEE; 0-7803-5565-2/99; pg351-pg355. | |
| N | | JALLOUL, L. et al.; Performance Analysis of CDMA Transmit Diversity Methods; 1999 IEEE; 0-7802-5435-4/99; pg 1326-pg1330. | |
| G | | RAITOLA, M. et al.; Transmisison Diversity in Wideband CDMA; 1999 IEEE; 0-7803-5565-2/99; pg1545-1549. | |
| A | | CORREIA, A. et al.; Optimised Constellations for Transmitter Diversity; 1999 IEEE; 0/7803-5435-4/99; pg1785-1789. | |
| E | | TAROKH, V. et al.; A Differential Detection Scheme for Transmit Diversity; 1999 IEEE; 0-7803-5668-3/99; pg1043-pg1047. | |
| L | | <i>QUEY, Jiann Ching; Concatenated coding for transmit diversity systems Proceedings of the 1999 VTC - Fall IEEE VTS 50th Vehicular Technology Conference Gateway to 21st Century Communications Village; Neth. Sept 19-22, 1999, Vol 5 1999</i> | |
| R | | A. HIROIKE, F. ADACHI, N. NAKAJIMA "Combined Effects of Phase Sweeping Transmitter Diversity and Channel Coding", IEEE Transactions on Vehicular Technology, Vol 41, No. 2, May 1992 | |
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